

Claims

1. A process to carry out toasting of casks for wine guard, comprising following stages:
 - 5 a) connecting the inside of the cask to mechanical elements forming a hermetic toasting chamber wherein no aromatic compounds are liberated to the outside;
 - b) circulating an air stream within said chamber;
 - c) directly or indirectly heating said air stream to a temperature varying from
 - 10 140°C to about 230°C;
 - d) directing said air stream to the inner cask walls;
 - e) capturing said air stream at the cask outlet;
 - f) directly or indirectly reheating said captured air stream to a temperature between 140°C to about 230°C;
 - 15 g) recycling said reheated air stream to the inner cask walls; and
 - h) maintaining stage (g) for a required time to achieve the desired temperature and/or toasting.
2. A process to carry out toasting of casks for wine guard according to claim 1, wherein said air stream may be circulated parallel to cask walls on stages (d) and
 - 20 (g).
3. A process to carry out toasting of casks for wine guard according to claim 1, wherein said air stream may be circulated as a whirling spiral stream on stages (d) and (g).
4. A process to carry out toasting of casks for wine guard according to claims 1, 2
 - 25 or 3, wherein said cask rotates together with said mechanical elements on stage (a).
5. A process to carry out toasting of casks for wine guard according to any preceding claim, wherein temperature may be stepwise risen to a temperature in the range between 140°C and about 230°C.
- 30 6. A process to carry out toasting of casks for wine guard according to any preceding claim, wherein temperature may be lineally risen to a temperature in the range between 140°C and about 230°C.

7. A process to carry out toasting of casks for wine guard according to claims 1, 5 or 6, wherein the different variations of temperature application are directly related to hot air stream recycling time towards inner cask walls.
- 5 8. A process to carry out toasting of casks for wine guard according to any preceding claim, wherein a number of casks are connected to a number of mechanical elements to form a number of hermetic chambers on stage (a).
9. A process to carry out toasting of casks for wine guard according to claim 8, wherein casks are connected in parallel on said stage (a).
- 10 10. A process to carry out toasting of casks for wine guard according to claim 8, wherein casks are connected in series on said stage (a).
11. An apparatus to carry out a convective toasting process of casks for wine guard, which comprises:
 - a) connecting means to connect a cask with mechanical elements to maintain a hermetic environment within;
 - 15 b) circulating means to circulate an air stream, within said hermetic environment;
 - c) heating means to heat said air stream;
 - d) controlling means to control the temperature of the air to be introduced into the casks;
 - 20 e) circulating means to circulate said hot air stream into the cask, from an inlet to an outlet, wherein said hot air stream circulates over the inner cask walls; and
 - f) capturing means to capture air from the cask outlet and to recycle it to the cask inlet.
- 25 12. An apparatus according to claim 11, wherein said means (e) allows said air stream to circulate parallel to inner cask walls.
13. An apparatus according to claim 11, wherein said means (e) allows said air stream to circulate as a whirling spiral stream.
14. An apparatus according to claims 11, 12 or 13, wherein said means (a) allow the
 - 30 cask rotating together with said mechanical elements.

15. An apparatus according to any of claims 11 to 14, wherein said means (a) allow connecting a number of casks to a number of mechanical elements to form a number of hermetic chambers.
- 5 16. An apparatus according to claim 15, wherein said casks are connected in parallel.
17. An apparatus according to claim 15, wherein said casks are connected in series.
18. An apparatus according to any of claims 11 to 17, wherein said used mechanical elements are circular metallic plates having a central hole to which inlet and outlet ducts are connected, wherein said cask may be connected to said metallic plates using coupling elements well known in the art.
- 10 19. An apparatus according to any of claims 11 to 18, wherein said circulating means to circulate air into the chamber formed by said cask and said mechanical elements, are blowers.
20. An apparatus according to any of claims 11 to 19, wherein said air may be directly heated by a clean fuel burner.
- 15 21. An apparatus according to any of claims 11 to 19, wherein said air may be directly heated by an electrical heater.
22. An apparatus according to any of claims 11 to 19, wherein said air may be indirectly heated by a heat exchanger.
- 20 23. An apparatus according to claim 20, wherein said temperature may be controlled by regulating heat flow, which may be done by controlling fuel admission to the burner.
24. An apparatus according to claim 21, wherein said temperature may be controlled by regulating heat flow, which may be done by controlling electrical heater power.
- 25 25. An apparatus according to claim 22, wherein said temperature may be controlled by regulating heat flow, which may be done by controlling thermal fluid amount or temperature in said heat exchanger.
26. An apparatus according to any of claims 11 to 25, wherein said capturing and recycling means are ducts placed at the cask outlet and connecting ducts between the heat source and the cask inlet.
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